



# Data Handling

## Understanding the Lesson

- Data: Discrete and continuous data
- Frequency distribution table
- Range of the set of data
- Relative frequency
- Grouped frequency distribution
- Class-interval, upper limit and lower limit
- Class size, class-mark and class frequency
- Drawing bar graph, histogram and pie chart to represent the data
- Probability: Possible and impossible events
- Estimating probability by experiments.

## Conceptual Facts

- Data: Collection of information as numerical facts about the objects or events is called Data.
- Types of Data: Discrete and continuous.
- Frequency: The number of times each score occurs is called frequency.
- Range: The difference between the greatest and the least observations is called the Range.
- Relative Frequency: The ratio of the frequency of each item to the sum of all frequencies is called Relative frequency.

$$\text{Relative frequency} = \frac{\text{Frequency of an object}}{\text{Total frequency}}$$

- Class-size: Difference between upper and lower limits of a class interval is called class-size.
- Class-mark: Mid value of class interval is called its class-mark.

$$\text{Class-mark} = \frac{\text{Upper limit} + \text{Lower limit}}{2}$$

- Class-frequency: The frequency of a particular class-interval is called class-frequency.
- Bar Graph: Horizontal and vertical
- Histogram: Horizontal and vertical
- Pie chart: Pie chart is a way of representing the data in the form of sectors of a circle.
- Central angle for a sector =  $\left( \frac{\text{Value of the component}}{\text{Total value}} \times 360 \right)^\circ$

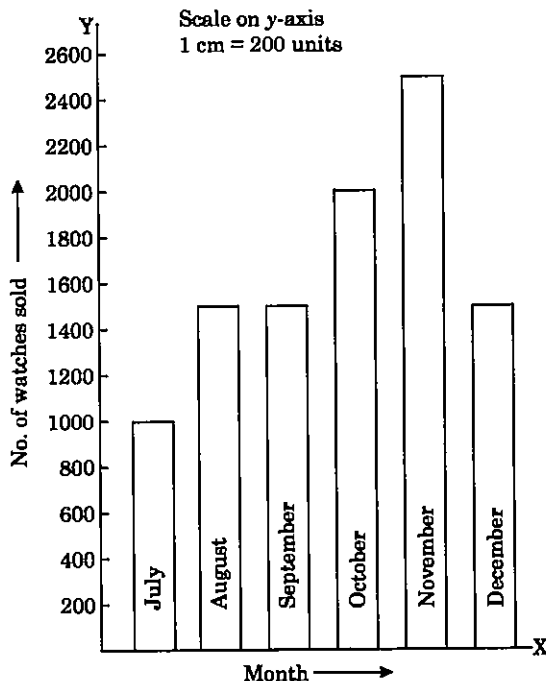
**TRY THESE – PAGE 71**

Draw an appropriate graph to represent the given information.

**Q1.**

Month	Number of watches sold
July	1000
August	1500
September	1500
October	2000
November	2500
December	1500

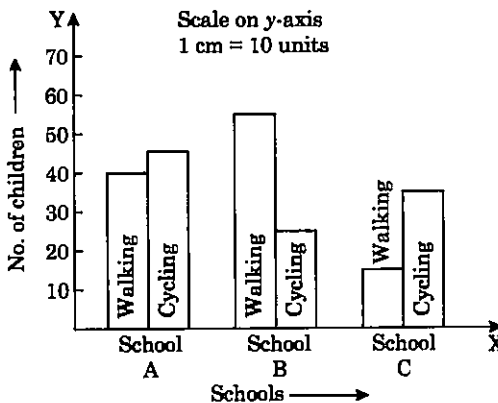
**Sol.**



**Q2.**

Children who prefer	School A	School B	School C
Walking	40	55	15
Cycling	45	25	35

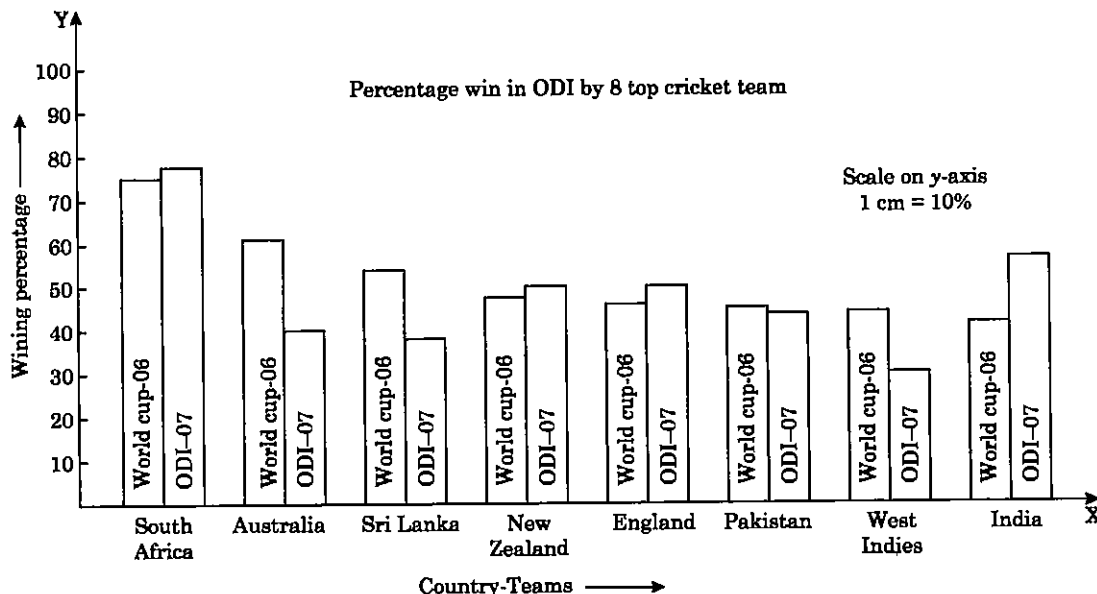
**Sol. Double Bar-graph**



**Q3. Percentage wins in ODI by 8 top cricket teams.**

Teams	From Champions trophy to World Cup-06	Last 10 ODI in 07
South Africa	75%	78%
Australia	61%	40%
Sri Lanka	54%	38%
New Zealand	47%	50%
England	46%	50%
Pakistan	45%	44%
West Indies	44%	30%
India	43%	56%

**Sol. Double Bar-graph**



**TRY THESE – PAGE 72**

**Q1.** A group of students were asked to say which animal they would like most to have as a pet. The result are given below.

dog, cat, cat, fish, cat, rabbit, dog, cat, rabbit, dog, cat, dog, dog, dog, cat, cow, fish, rabbit, dog, cat, dog, cat, cat, dog, rabbit, cat, fish, dog.

Make a frequency distribution table for the same.

Sol.

Animals	Tally marks	Frequency
Dog		10
Cat		10
Fish		3
Rabbit		4
Cow		1
<b>Total</b>		<b>28</b>

**TRY THESE – PAGE 73**

**Q1.** Study the following frequency distribution table and answer the questions given below.

**Frequency Distribution of Daily Income of 550 workers of a factory**

Class Interval (Daily Income in ₹)	Frequency (Number of Workers)
100–125	45
125–150	25
150–175	55
175–200	125
200–225	140
225–250	55
250–275	35
275–300	50
300–325	20
<b>Total</b>	<b>550</b>

- What is the size of the class intervals?
- Which class has the highest frequency?
- Which class has the lowest frequency?
- What is the upper limit of the class-interval 250–275?
- Which two classes have the same frequency?

**Sol.** From the given table, we have

- The size of the class intervals is 25
- 200–225 has the highest frequency 140
- 300–325 has the lowest frequency 20.
- Upper limit of 250–275 is 275
- Classes 150–175 and 225–250 have the same frequency 55.

**Q2.** Construct a frequency distribution table for the data on weights (in kg) of 20 students of a class using intervals 30–35, 35–40 and so on.

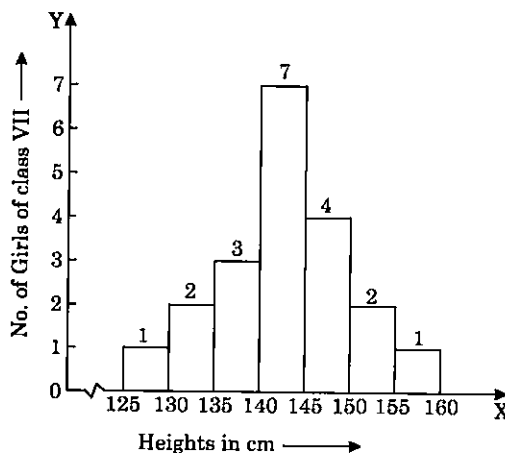
40, 38, 33, 48, 60, 53, 31, 46, 34, 36, 49, 41, 55, 49, 65, 42, 44, 47, 38, 39

**Sol.** **Frequency distribution table:**

Weight (in kg)	Tally marks	Frequency
30–35		3
35–40		4
40–45		4
45–50		5
50–55		1
55–60		1
60–65		1
65–70		1
<b>Total</b>		<b>20</b>

**TRY THESE – PAGE 75**

**Q1.** Observe the histogram and answer the questions given below:



- What information is being given by the histogram?
- Which group contains maximum girls?

- (iii) How many girls have a height of 145 cm and more?
- (iv) If we divide the girls into the following three categories, how many would there be in each?
- 150 cm and more – Group A  
 140 cm to less than 150 cm – Group B  
 Less than 140 cm – Group C

- Sol. (i) The above histogram represents the height (in cm) of the girls of class VII.
- (ii) Group 140–145 contains the maximum number of girls.
- (iii) Seven girls have a height of 145 cm and more.
- (iv) Number of girls in Group A = 3  
 Group B = 11  
 Group C = 6

### EXERCISE 5.1

Q1. For which of these would you use a histogram to show the data?

- (i) The number of letters for different areas in a postman's bag.
- (ii) The height of competitors in an athletics meet.
- (iii) The number of cassettes produced by 5 companies.
- (iv) The number of passengers boarding trains from 7 a.m to 7 p.m at a station.  
 Give reason for each.

Sol. (i) Number of areas cannot be represented in class-intervals. So, we cannot use histogram to show the data.

- (ii) Height of competitors can be divided into intervals. So, we can use histogram here.

For example:

Height in (cm)	No. of competitors
150–160	10
160–170	12
170–180	5
180–190	2

- (iii) Companies cannot be divided into intervals. So, we cannot use histogram here.
- (iv) Time for boarding the train can be divided into intervals. So, we can use histogram here.

For example:

Time in hours	Number of passengers
7 am–10 am	1500
10 am–1 pm	2000
1 pm–4 pm	1000
4 pm–7 pm	800

Q2. The shoppers who come to a departmental store are marked as: man (M), woman (W), boy (B) or girl (G). The following list gives the shoppers who came during the first hour in the morning.

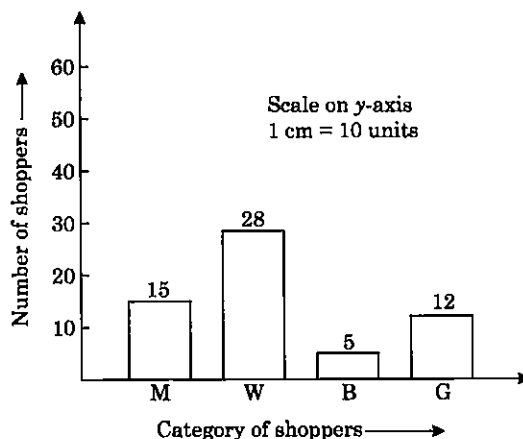
W W W G B W W M G G M M W W W W  
 G B M W B G G M W W M M W W W  
 M W B W G M W W W W G W M M W

W M W G W M G W M M B G G W  
 Make a frequency distribution table using tally marks. Draw a bar graph to illustrate it.

Sol.

Shoppers	Tally marks	Frequency
M		15
W		28
B		5
G		12
<b>Total</b>		<b>60</b>

Bar Graph



Q3. The weekly wages (in ₹) of 30 workers in a factory are:

830, 835, 890, 810, 835, 836, 869, 845, 898, 890, 820, 860, 832, 833, 855, 845, 804, 808, 812, 840, 885, 835, 835, 836, 878, 840, 868, 890, 806, 840

Using tally marks make a frequency table with intervals as 800–810, 810–820 and so on.

Sol.

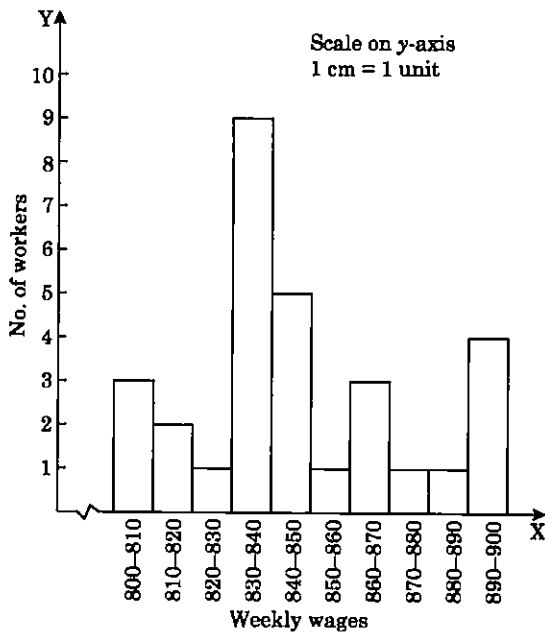
Class-intervals	Tally marks	Frequency
800–810		3
810–820		2
820–830		1
830–840		9
840–850		5

850–860		1
860–870		3
870–880		1
880–890		1
890–900		4
<b>Total</b>		<b>30</b>

Q4. Draw a histogram for the frequency table made for the data in Question 3, and answer the following questions:

- Which group has the maximum number of workers?
- How many workers earn ₹ 850 and more?
- How many workers earn less than ₹ 850?

Sol. Refer to the frequency table of Question No. 3.

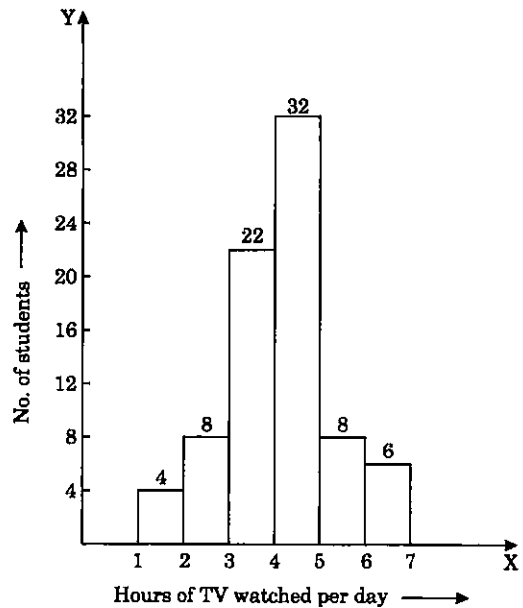


- Group 830–840 has the maximum number of workers, i.e., 9.
- 10 workers earn equal and more than ₹ 850.
- 20 workers earn less than ₹ 850.

Q5. The number of hours for which students of a particular class watched television during holidays is shown through the given graph.

Answer the following questions.

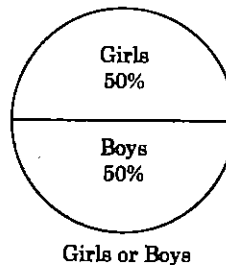
- For how many hours did the maximum number of students watch TV?
- How many students watched TV for less than 4 hours?
- How many students spent more than 5 hours in watching TV?



- Sol. (i) 32 is the maximum number of students who watched TV for 4 to 5 hours.
- (ii)  $4 + 8 + 22 = 34$  students watched TV for less than 4 hours.
- (iii)  $8 + 6 = 14$  students watched TV for more than 5 hours.

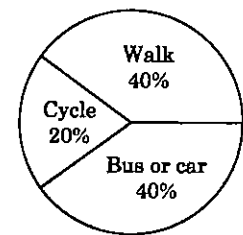
TRY THESE – PAGE 78

Q1. Each of the following pie charts below, gives you a different piece of information about your class. Find the fraction of the circle representing each of these information.



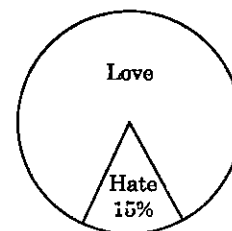
Girls or Boys

(i)



Transport to school

(ii)



(iii)

Sol. (i) Boys =  $\frac{50}{100} = \frac{1}{2}$

$$\text{Girls} = \frac{50}{100} = \frac{1}{2}$$

$$(ii) \text{ Bus or car} = \frac{40}{100} = \frac{2}{5}$$

$$\text{Walk} = \frac{40}{100} = \frac{2}{5}$$

$$\text{Cycle} = \frac{20}{100} = \frac{1}{5}$$

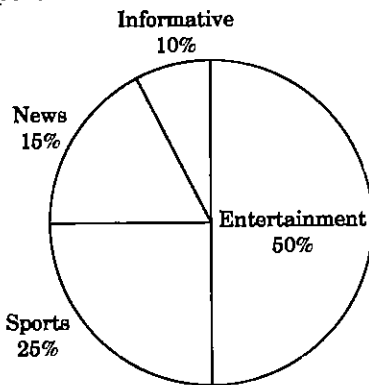
$$(iii) \text{ Love} = \frac{85}{100} = \frac{17}{20}$$

$$\text{Hate} = \frac{15}{100} = \frac{3}{20}$$

Q2. Answer the following questions based on the pie chart given below.

(i) Which type of programmes are viewed the most?

(ii) Which two types of programmes have number of viewers equal to those watching sports channels?



Viewers watching different types of channels on TV.

Sol. (i) Entertainment programmes are viewed most. (50% viewers)

(ii) Percentage of viewers watching sports = 25%  
 Percentage of viewers watching news and informative channel = 10% + 15% = 25%  
 Hence news and informative viewers are same in number as that of sports channel.

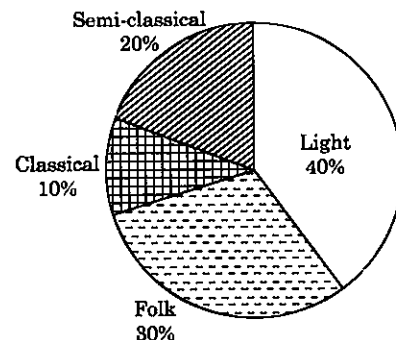
### EXERCISE 5.2

Q1. A survey was made to find the type of music that a certain group of young people liked in a city. Adjoining pie chart shows the findings of this survey.

From this pie chart answer the following:

(i) If 20 people liked classical music, how many young people were surveyed?

(ii) Which type of music is liked by the maximum number of people?



### TRY THESE – PAGE 81

Q1. Draw a pie chart of the data given below.

The time spent by a child during a day.

Sleep – 8 hours

School – 6 hours

Home work – 4 hours

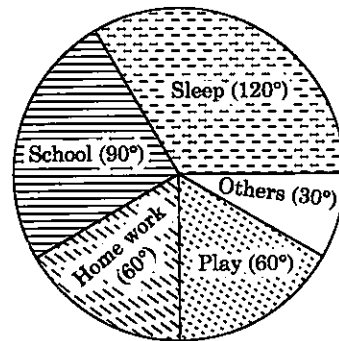
Play – 4 hours

Others – 2 hours

Sol.

Activity	Number of hours	In fraction	Central angle
Sleep	8	$\frac{8}{24} = \frac{1}{3}$	$\frac{1}{3} \times 360^\circ = 120^\circ$
School	6	$\frac{6}{24} = \frac{1}{4}$	$\frac{1}{4} \times 360^\circ = 90^\circ$
Home work	4	$\frac{4}{24} = \frac{1}{6}$	$\frac{1}{6} \times 360^\circ = 60^\circ$
Play	4	$\frac{4}{24} = \frac{1}{6}$	$\frac{1}{6} \times 360^\circ = 60^\circ$
Others	2	$\frac{2}{24} = \frac{1}{12}$	$\frac{1}{12} \times 360^\circ = 30^\circ$
Total	24 hours		

Pie chart



(iii) If a cassette company were to make 1000 CD's. How many of each type would they make?

Sol. (i) Number of young people who were surveyed  
 $= \frac{100 \times 20}{10} = 200$  people.

(ii) Light music is liked by the maximum people, i.e., 40%

(iii) Total number of CD = 1000




$\therefore$  Number of viewers who like classical music  
 $= \frac{10 \times 1000}{100} = 100$

Number of viewer who like semi-classical music  
 $= \frac{20 \times 1000}{100} = 200$

Number of viewers who like light music  
 $= \frac{40 \times 1000}{100} = 400$

Number of viewers who like folk music  
 $= \frac{30 \times 1000}{100} = 300$

Q2. A group of 360 people were asked to vote for their favourite season from the three seasons rainy, winter and summer.

Season	No. of votes
Summer 	90
Rainy 	120
Winter 	150

(i) Which season got the most votes?

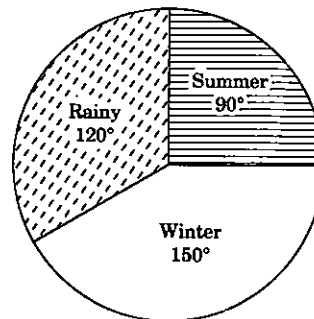
(ii) Find the central angle of each sector.

(iii) Draw a pie chart to show this information.

Sol. (i) Winter season got the most votes, i.e. 150

Season	Number of votes	Central angle
Summer	90	$\frac{90}{360} \times 360^\circ = 90^\circ$
Rainy	120	$\frac{120}{360} \times 360^\circ = 120^\circ$
Winter	150	$\frac{150}{360} \times 360^\circ = 150^\circ$
<b>Total</b>	<b>360</b>	

(iii) Pie chart

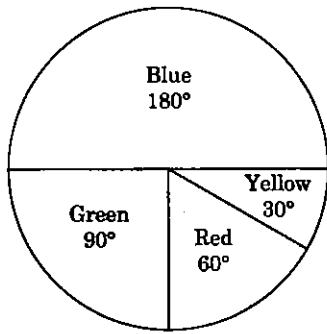


Q3. Draw a pie chart showing the following information. The table shows the colours preferred by a group of people.

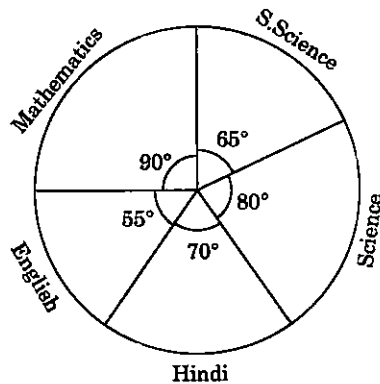
Colours	Number of People
Blue	18
Green	9
Red	6
Yellow	3
<b>Total</b>	<b>36</b>

Sol. Table to find the central angle of each sector

Colours	Number of People	Central angle
Blue	18	$\frac{18}{36} \times 360^\circ = 180^\circ$
Green	9	$\frac{9}{36} \times 360^\circ = 90^\circ$
Red	6	$\frac{6}{36} \times 360^\circ = 60^\circ$
Yellow	3	$\frac{3}{36} \times 360^\circ = 30^\circ$
<b>Total</b>	<b>36</b>	



Q4. The following pie chart gives the marks scored in an examination by a student in Hindi, English, Mathematics, Social Science and Science. If the total marks obtained by the students were 540, answer the following questions.



(i) In which subject did the student score 105 marks?

(Hint: for 540 marks, the central angle =  $360^\circ$ . So, for 105 marks, what is the central angle?)

(ii) How many more marks were obtained by the student in Mathematics than in Hindi?

(iii) Examine whether the sum of the marks obtained in Social Science and Mathematics is more than that in Science and Hindi.

(Hint: Just study the central angles).

Sol.	Subjects	Central angles
	Mathematics	$90^\circ$
	English	$55^\circ$
	Hindi	$70^\circ$
	Science	$80^\circ$
	S. Science	$65^\circ$

(i) For 540 marks, the central angle =  $360^\circ$

$\therefore$  For 105 marks the central angle

$$= \frac{360}{540} \times 105 = 70^\circ$$

$\therefore$  Corresponding subject = Hindi

(ii) Marks obtained in Mathematics

$$= \frac{90}{360} \times 540 = 135$$

$\therefore$  Marks obtained in Mathematics more than Hindi =  $135 - 105 = 30$

(iii) Central angle of Social Science

+ Mathematics

$$= 65^\circ + 90^\circ = 155^\circ$$

Central angle of Science + Hindi

$$= 80^\circ + 70^\circ = 150^\circ$$

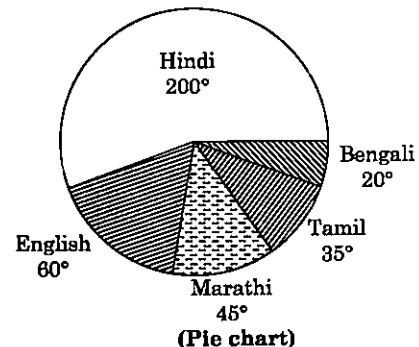
$\therefore$  Marks obtained in Social Science and Mathematics are more than that of the marks obtained in Science and Hindi.

Q5. The number of students in a hostel, speaking different languages is given below. Display the data in a pie chart.

Language	Number of students
Hindi	40
English	12
Marathi	9
Tamil	7
Bengali	4
<b>Total</b>	<b>72</b>

Sol.

Language	Number of students	Central angle
Hindi	40	$\frac{40}{72} \times 360^\circ = 200^\circ$
English	12	$\frac{12}{72} \times 360^\circ = 60^\circ$
Marathi	9	$\frac{9}{72} \times 360^\circ = 45^\circ$
Tamil	7	$\frac{7}{72} \times 360^\circ = 35^\circ$
Bengali	4	$\frac{4}{72} \times 360^\circ = 20^\circ$
<b>Total</b>	<b>72</b>	





TRY THESE – PAGE 83

Q1. If you try to start a scooter, what are the possible outcomes?

Sol. There are two possible outcomes.

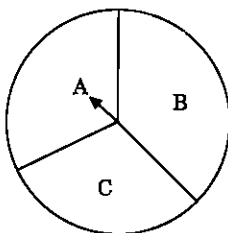
- (i) Scooter can start
- (ii) Scooter can not start

Q2. When a die is thrown, what are the six possible outcomes?

Sol. When a die is thrown, there are six possible outcomes, i.e., 1, 2, 3, 4, 5 or 6 numbers. (Total six outcomes)

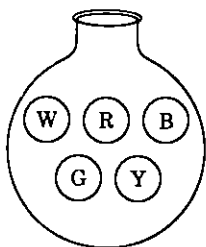
Q3. When you spin the wheel shown alongside, what are the possible outcomes? List them

(Outcome means the sector at which the pointer stops).



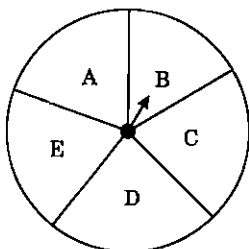
Sol. When the given wheel is spun, the following sectors may get the pointer A, B or C. (Total three outcomes)

Q4. You have a bag with five identical balls of different colours and you are to pull out (draw) a ball without looking at it. List the outcomes you would get.



Q1. List the outcomes you can see in these experiments.

(i) Spinning a wheel



(ii) Tossing two coins together

Sol. (i) On spinning the wheel, we can get the following outcomes B, C, D, E and A

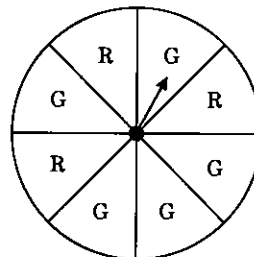
(ii) When two coins are tossed together, we get the following outcomes

Sol. Possible outcomes are white ball, red ball, blue ball, green ball or yellow ball. (Total five outcomes)

TRY THESE – PAGE 86

Q1. Suppose you spin the wheel.

(i) List the number of outcomes of getting a green sector and not getting a green sector on this wheel.



(ii) Find the probability of getting a green sector.

(iii) Find the probability of not getting a green sector.

Sol. (i) Number of outcomes of getting green sector = Number of green sector = 5

Number of outcomes of getting non green sector =

Number of non green sector = 3

Total No. of sectors = 8

(ii) Probability of getting green sector =

$$\frac{\text{Number of green sector}}{\text{Total number of sector}} = \frac{5}{8}$$

(iii) Probability of not getting a green sector =  $\frac{3}{8}$

$$\text{or } 1 - \frac{5}{8} = \frac{3}{8}$$

**EXERCISE 5.3**

HH, HT, TH, TT

(Where H denotes Head and T denotes Tail)

Q2. When a die is thrown, list the outcomes of an event of getting

(i) (a) a prime number

(b) not a prime number

(ii) (a) a number greater than 5

(b) a number not greater than 5

Sol. (i) (a) Prime number are 2, 3 and 5

∴ Required outcomes = 2, 3 and 5

(b) Outcomes for not a prime number are 1, 4 and 6

∴ Required outcomes = 1, 4, 6.

(ii) (a) Outcomes for a number greater than 5 = 6

∴ Required outcome = 6

(b) Outcomes for a number not greater than 5 are 1, 2, 3, 4, 5

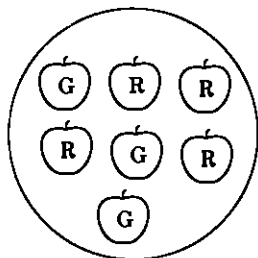
∴ Required outcomes = 1, 2, 3, 4, 5.

**Q3.** Find the

(i) Probability of the pointer stopping on D in (Question 1-(a))?

(ii) Probability of getting an ace from a well shuffled deck of 52 playing cards?

(iii) Probability of getting a red apple. (see figure below)



**Sol.** (i) Refer to fig. Question 1-(a)

Total number of sectors = 5

Number of sector where the pointer stops = 1, i.e. D

∴ Probability of pointer stopping at D =  $\frac{1}{5}$

(ii) Number of aces = 4 (one from each suit i.e. heart, diamond, club and spade)

Total number of playing cards = 52

∴ Probability of getting an ace

$$= \frac{\text{Number of aces}}{\text{Total number of playing cards}}$$

$$= \frac{4}{52} = \frac{1}{13}$$

(iii) Total number of apples = 7

Number of red apples = 4

∴ Probability of getting red apples

$$= \frac{\text{Number of red apples}}{\text{Total number of apples}} = \frac{4}{7}$$

**Q4.** Numbers 1 to 10 are written on ten separate slips (one number on one slip), kept in a box and mixed well. One slip is chosen from the box without looking into it. What is the probability of:

(i) getting a number 6?

(ii) getting a number less than 6?

(iii) getting a number greater than 6?

(iv) getting a 1-digit number?

**Sol.** (i) Probability of getting a number 6

$$= \frac{1}{10}$$

(ii) Probability of getting a number less than 6

$$= \frac{5}{10} = \frac{1}{2} \quad [\because \text{Numbers less than 6}$$

are 1, 2, 3, 4, 5]

(iii) Probability of getting a number greater than

$$6 = \frac{4}{10} = \frac{2}{5} \quad [\because \text{Number greater than 6}$$

are 7, 8, 9, 10]

(iv) Probability of getting a 1-digit number =  $\frac{9}{10}$

[\because 1-digit numbers are 9, i.e.

1, 2, 3, 4, 5, 6, 7, 8, 9]

**Q5.** If you have a spinning wheel with 3 green sectors, 1 blue sector and 1 red sector, what is the probability of getting a green sector? What is the probability of getting a non blue sector?

**Sol.** Total number of sectors are

= 3 green + 1 blue + 1 red

= 5 sectors

∴ Probability of getting a green sector

$$= \frac{\text{Number of green sectors}}{\text{Total number of sectors}} = \frac{3}{5}$$

Number of non-blue sectors are

= 3 green + 1 red

= 4 sectors

∴ Probability of getting non-blue sector

$$= \frac{\text{Number of non-blue sectors}}{\text{Total number of sectors}} = \frac{4}{5}$$

**Q6.** Find the probabilities of the events given in Question 2.

**Sol.** Refer to Question 2, we have

(i) (a) Probability of getting a prime number

$$= \frac{\text{Number of prime numbers}}{\text{Total number of outcomes}}$$

$$= \frac{3}{6} = \frac{1}{2}$$

(b) Probability of getting a non-prime number

$$= \frac{\text{Number of non-prime numbers}}{\text{Total number of outcomes}}$$

$$= \frac{3}{6} = \frac{1}{2}$$

(ii) (a) Probability of getting a number greater

$$\text{than 5} = \frac{1}{6}$$

(b) Probability of a number not greater than

$$5 = \frac{5}{6} \text{ or } 1 - \frac{1}{6} = \frac{5}{6}$$

## Learning More Q & A

### I. VERY SHORT ANSWER (VSA) QUESTIONS

**Q1.** In the class interval 5–10, find the

- (i) lower limit      (ii) upper limit  
(iii) class mark      (iv) class size

**Sol.** (i) lower limit = 5

(ii) upper limit = 10

$$(iii) \text{ class mark} = \frac{5 + 10}{2} = \frac{15}{2} = 7.5$$

(iv) Class size =  $10 - 5 = 5$

**Q2.** A group of 20 students recorded their heights (in cm). The data received were as given below. What is the range?

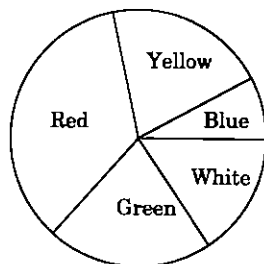
150, 120, 112, 160, 155, 151, 158, 142, 148, 149, 161, 165, 140, 157, 156, 146, 148, 153, 138, 135

**Sol.** The minimum height = 112 cm

Maximum height = 165 cm

$$\begin{aligned} \therefore \text{Range} &= \text{Maximum height} \\ &\quad - \text{Minimum height} \\ &= 165 \text{ cm} - 112 \text{ cm} = 47 \text{ cm} \end{aligned}$$

**Q3.** In the given pie chart, which colour is most popular? Which colour is the least popular?



**Sol.** Red colour is most popular and blue colour is the least popular.

**Q4.** A die is thrown once. Find the probability of getting a number greater than 4.

**Sol.** Number greater than 4 = 5, 6

$$\therefore n(E) = 2$$

Sample space  $n(S) = 6$

$\therefore$  Probability of getting a number greater than

$$4 = \frac{n(E)}{n(S)} = \frac{2}{6} = \frac{1}{3}$$

Where  $n(E)$ : Number of favourable outcomes

$n(S)$ : Total number of outcomes

**Q5.** A class consists of 21 boys and 9 girls. A student is to be selected for social work. Find the probability that

- (i) a girl is selected  
(ii) a boy is selected

**Sol.** Sample space  $n(S) = 21 + 9 = 30$

Number of girls  $n(E) = 9$

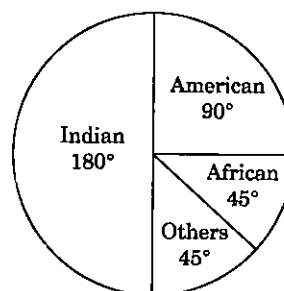
(i) Probability of selecting a girl

$$= \frac{n(E)}{n(S)} = \frac{9}{30} = \frac{3}{10}$$

(ii) Probability of selecting a boy

$$= \frac{n(E)}{n(S)} = \frac{21}{30} = \frac{7}{10}$$

**Q6.** The following pie chart depicts the percentage of students, nationwide. What is the percentage of (i) Indian students (ii) African students?



**Sol.** (i) Percentage of Indian students

$$= \frac{180 \times 100}{360} = 50\%$$

(ii) Percentage of African students

$$= \frac{45 \times 100}{360} = 12\frac{1}{2}\%$$

### SHORT ANSWER (SA) QUESTIONS

**Q7.** Fill in the blanks:

Weights in kg	Class-mark
10–15	—
15–20	—
20–25	—
25–30	—
30–35	—
35–40	—

**Sol.** Class-marks are  
Class-mark

$$= \frac{\text{Upper limit} + \text{Lower limit}}{2}$$

$$\frac{10 + 15}{2} = \frac{25}{2} = 12.5$$

$$\frac{15 + 20}{2} = \frac{35}{2} = 17.5$$

$$\frac{20 + 25}{2} = \frac{45}{2} = 22.5$$

$$\frac{25 + 30}{2} = \frac{55}{2} = 27.5$$

$$\frac{30 + 35}{2} = \frac{65}{2} = 32.5$$

$$\frac{35 + 40}{2} = \frac{75}{2} = 37.5$$

∴ Value of the blank spaces are

Weights in kg	Class-mark
10–15	12.5
15–20	17.5
20–25	22.5
25–30	27.5
30–35	32.5
35–40	37.5

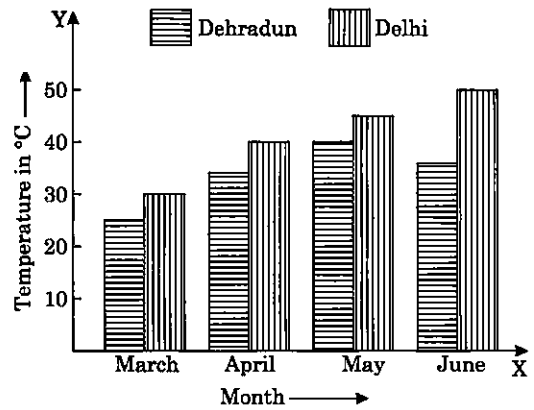
Q8. Construct a frequency table for the following marks obtained by 50 students using equal intervals taking 16–24 (24 not included) as one of the class-intervals.

52, 16, 18, 20, 42, 48, 39, 38, 54, 58, 47, 37, 25, 16, 42, 49, 36, 35, 53, 21, 30, 43, 56, 34, 33, 17, 22, 24, 37, 41, 40, 50, 54, 56, 54, 36, 38, 42, 44, 56, 17, 18, 22, 24, 17, 48, 58, 23, 29, 58

Class-interval	Tally marks	Frequency
16–24		12
24–32		5
32–40		10
40–48	III	8
48–56	III	8
56–64	II	7
<b>Total</b>		<b>50</b>

Q9. The double bar graph shows the average monthly temperatures of two cities over 4 months period. Read the graph carefully and answer the questions given below:

(i) What does each 1 cm block on the vertical axis represent?



- (ii) What was the average monthly temperature in Dehradun in (a) March (b) April (c) May (d) June?
- (iii) What was the average monthly temperature in Delhi for the whole 4 months?
- (iv) In which month was the difference between the temperature of Delhi and Dehradun maximum and how much?

Sol. (i) 1 cm block on vertical axis = 10°C

- (ii) The average monthly temperature in Dehradun in the month of  
 (a) March was 25°C (b) April was 34°C  
 (c) May was 40°C (d) June was 36°C

(iii) The average monthly temperature in Delhi in the 4 months

$$\begin{aligned} & \text{Temperature of} \\ & \text{(March + April + May + June)} \\ & = \frac{\quad\quad\quad}{4} \\ & = \frac{30^\circ\text{C} + 40^\circ\text{C} + 45^\circ\text{C} + 50^\circ\text{C}}{4} \\ & = \frac{165^\circ\text{C}}{4} = 41.25^\circ\text{C} \end{aligned}$$

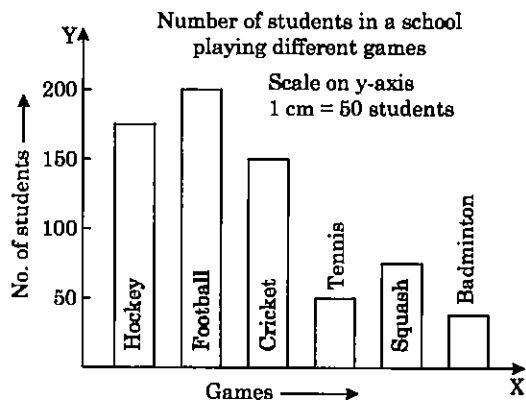
(iv) Difference between the average monthly temperature of Delhi and Dehradun was maximum in the month of June, i.e. (50°–36°) = 14°C.

Q10. The following table represents the number of students in a school playing six different games.

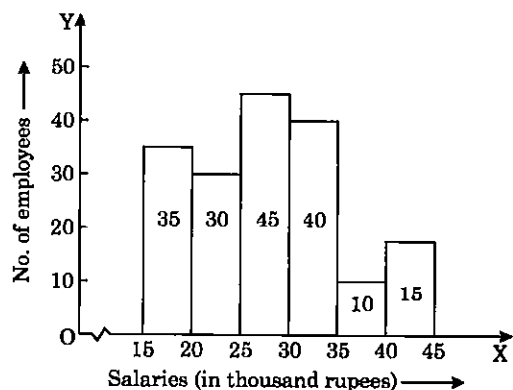
Games	Number of students
Hockey	175
Football	200
Cricket	150
Tennis	50
Squash	75
Badminton	40

Present the above information on a bar graph.

Sol.



Q11. Prepare a grouped frequency table for the given histogram.



Sol.

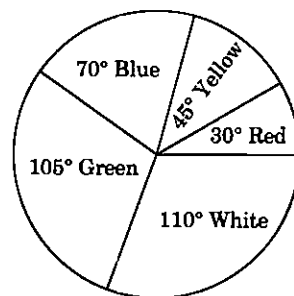
Salary (in thousand ₹)	Number of Employee
15-20	35
20-25	30
25-30	45
30-35	40
35-40	10
40-45	15

Q12. A bag contains 144 coloured balls represented by the following table. Draw a pie chart to show this information.

Colour	Number of balls
Red	12
Yellow	18
Blue	28
Green	42
White	44

Sol.

Colour	Number of balls	Central Angle
Red	12	$\frac{12}{144} \times 360^\circ = 30^\circ$
Yellow	18	$\frac{18}{144} \times 360^\circ = 45^\circ$
Blue	28	$\frac{28}{144} \times 360^\circ = 70^\circ$
Green	42	$\frac{42}{144} \times 360^\circ = 105^\circ$
White	44	$\frac{44}{144} \times 360^\circ = 110^\circ$



Pie chart

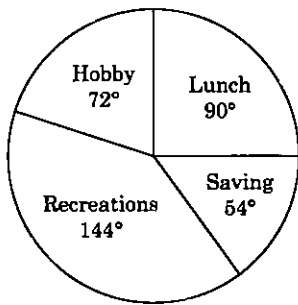
Q13. Mrs. Verma spends her allowance in the following way.

Items	Percent
Lunch	25%
Hobby	20%
Recreations	40%
Saving	15%
Total	100%

Represent the above information by a pie chart.

Sol.

Items	Percent	Central angle
Lunch	25%	$\frac{25}{100} \times 360^\circ = 90^\circ$
Hobby	20%	$\frac{20}{100} \times 360^\circ = 72^\circ$
Recreations	40%	$\frac{40}{100} \times 360^\circ = 144^\circ$
Saving	15%	$\frac{15}{100} \times 360^\circ = 54^\circ$



**Q14.** What is the probability of getting a marble which is not red from a bag containing 3 black, 8 yellow, 2 red and 5 white marbles.

**Sol.** Total number of balls  
 = 3 black + 8 yellow + 2 red + 5 white  
 = 18  
 $\therefore n(S) = 18$   
 Number of the balls which are not red  
 = 3 + 8 + 5 = 16  
 $\therefore n(E) = 16$   
 $\therefore$  Probability  
 $= \frac{n(E)}{n(S)} = \frac{16}{18} = \frac{8}{9}$

**Q15.** From a well shuffled deck of 52 playing cards, a card is selected at random. Find the probability of getting

- (i) a black card
- (ii) a black king
- (iii) an ace
- (iv) a card of diamond

**Sol.** Here,  $n(S) = 52$

- (i) Total number of black card = 26  
 $\therefore n(E) = 26$   
 $\therefore$  Probability of getting a black card  
 $= \frac{n(E)}{n(S)} = \frac{26}{52} = \frac{1}{2}$
- (ii) Number of black king = 2  
 $\therefore n(E) = 2$   
 $\therefore$  Probability of getting a black king  
 $= \frac{n(E)}{n(S)} = \frac{2}{52} = \frac{1}{26}$
- (iii) Number of aces = 4  
 $\therefore n(E) = 4$   
 $\therefore$  Probability of getting an ace  
 $= \frac{n(E)}{n(S)} = \frac{4}{52} = \frac{1}{13}$
- (iv) Number of diamond cards = 13  
 $\therefore n(E) = 13$   
 $\therefore$  Probability of getting a card of diamond  
 $= \frac{n(E)}{n(S)} = \frac{13}{52} = \frac{1}{4}$

## Test Yourself

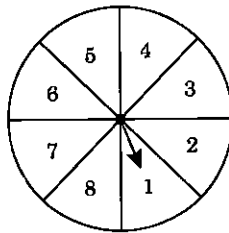
### I. VERY SHORT ANSWER (VSA) QUESTIONS

**Q1.** A die is rolled once. Find the probability of getting a number

- (i) 7
- (ii) less than 7
- (iii) prime numbers
- (iv) even numbers

**Q2.** A spinner is marked with numbers from 1 to 8. What is the probability of getting

- (i) multiple of 3
- (ii) getting a prime number
- (iii) a multiple of 2



**Q3.** Two coins are tossed together, find the probability of getting

- (i) both heads
- (ii) both tails
- (iii) at least one head

**Q4.** In the class-interval 28–32, find

- (i) lower limit
- (ii) upper limit
- (iii) class-mark
- (iv) class size

**Q5.** The following data represent the pocket allowance (in ₹) of 40 students. Form a frequency distribution table having class-interval 16–24 (24 not included)

39, 49, 61, 17, 28, 19, 49, 52, 61, 50, 20, 24, 18, 32, 38, 48, 46, 23, 24, 29, 17, 22, 24, 62, 56, 65, 21, 31, 41, 43, 52, 57, 47, 38, 39, 40, 46, 27, 62, 52

**Q6.** Following is the representation of some information. Fill in the blanks:

Items	Percent	Central angle
A	20%	—
B	30%	—
C	15%	—
D	25%	—
E	10%	—

**II. SHORT ANSWER (SA) QUESTIONS**

Q7. Meena secured marks in different subjects as shown in the following table.

Subjects	Marks
English	35
Computer	45
Science	40
Maths	60
Social Science	50

Represent the above information by bar graph.

Q8. Scholarship of students in a class are given in the following table:

Amount of Scholarship (in ₹)	Number of students
1000–1500	8
1500–2000	10
2000–2500	6
2500–3000	12
3000–3500	15
3500–4000	5

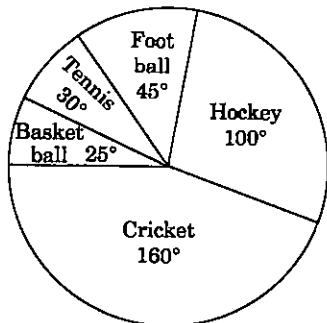
Represent the above information by a histogram.

Q9. The expenditure of a family on various heads is given in the following table:

Head	Expenditure (in ₹)
Rent	4000
Education	8000
Food	6000
Clothing	2000
Miscellaneous	4000
Total	24000

Represent the above data by pie chart.

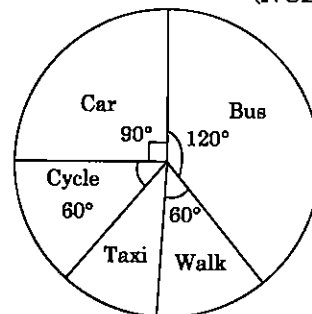
Q10. A pie chart given below represents the amount spent on different sports by a school in a certain year. If the money spent on football is ₹ 9000, answer the following questions:



- (i) What is the total amount spent on sports?
- (ii) How much amount is spent on hockey?
- (iii) What is the amount spent on cricket?

Q11. The pie chart given below shows the result of a survey carried out to find the modes of travel used by the children to go to school. Study the pie chart and answer the questions that follow.

(NCERT Exemplar)



- (a) What is the most common mode of transport?
- (b) What fraction of children travel by car?
- (c) If 18 children travel by car, how many children took part in the survey?
- (d) How many children use taxi to travel to school?
- (e) By which two modes of transport are equal number of children travelling?

Q12. In a district, the number of branches of different banks is given below:

Bank	State Bank of India	Bank of Baroda	Punjab National Bank	Canara Bank
Number of Branches	30	17	15	10

Draw a pie chart of this data.

(NCERT Exemplar)

Q13. Ankit bought 2 packs of red pens, 1 pack of blue pens, and 3 packs of black pens. The red pen pack have 4 pens each. The blue pen packs and the black pen packs have 3 pens each. He places his all pens in a pen holder. What is Ankit's probability of picking a red pen from the pen holder?

Q14. In the given figure, there are equal sized tiles numbered from 1 to 6 in a box. A tile is drawn out from the box at random. Match the events with its probabilities.

1	6	2
6	2	3
3	5	4
3	3	

Events	Probabilities
(i) getting a 3	(a) $\frac{2}{11}$
(ii) getting a 4 or 5	(b) $\frac{1}{11}$
(iii) getting a 1	(c) $\frac{9}{11}$
(iv) getting a number not 6	(d) $\frac{5}{11}$
(v) getting a 1 or 3	(e) $\frac{4}{11}$

Q15. A dice is rolled once. What is the probability that the number on top will be (NCERT Exemplar)

- (a) Odd (b) Greater than 5  
 (c) A multiple of 3 (d) Less than 1  
 (e) A factor of 36 (f) A factor of 6

Q16. Ritwik draws a ball from a bag that contains white and yellow balls. The probability of choosing a white ball is  $\frac{2}{9}$ . If the total number of balls in the bag is 36, find the number of yellow balls. (NCERT Exemplar)

### ANSWERS

1. (i) 0 (ii) 1 (iii)  $\frac{1}{2}$  (iv)  $\frac{1}{2}$

2. (i)  $\frac{1}{4}$  (ii)  $\frac{1}{2}$  (iii)  $\frac{1}{2}$

3. (i)  $\frac{1}{4}$  (ii)  $\frac{1}{4}$  (iii)  $\frac{3}{4}$

4. (i) 28 (ii) 32 (iii) 30 (iv) 4

5.	16–24	8
	24–32	7
	32–40	5
	40–48	6
	48–56	7
	56–64	5
	64–72	2

6.  $72^\circ, 108^\circ, 54^\circ, 90^\circ, 36^\circ$

10. (i) ₹ 72000 (ii) ₹ 20000 (iii) ₹ 32000

11. (a) Bus (b)  $\frac{1}{4}$  (c) 72 (d) 6  
 (e) car and walk

12.  13.  $\frac{2}{5}$

14. (i) (e) (ii) (a) (iii) (b) (iv) (c)  
 (v) (d)

15. (a)  $\frac{1}{2}$  (b)  $\frac{1}{6}$  (c)  $\frac{2}{6}$  or  $\frac{1}{3}$

(d) 0 (e)  $\frac{5}{6}$  (f)  $\frac{4}{6}$  or  $\frac{2}{3}$

16. 28

### Internal Assessment

Q1. Fill in the blanks:

(i) If the chance of winning a game is  $\frac{1}{2}$ , then the probability of losing is \_\_\_\_\_.

(ii) Probability of an event is always equal or less than \_\_\_\_\_.

(iii) The probability of an impossible event is \_\_\_\_\_.

(iv) Probability of an event

$$= \frac{\text{Number of favourable outcomes}}{\text{Total number of possible outcomes}}$$

(v) A die is rolled once. The probability of getting a number less than 7 is \_\_\_\_\_.

(vi) A die is rolled once. The probability of getting prime number is \_\_\_\_\_.

Q2. Choose the correct answers:

(i) The size of the class 40–50 is

- (a) 40 (b) 50  
 (c) 45 (d) 10

(ii) The class mark of the class 40–50 is

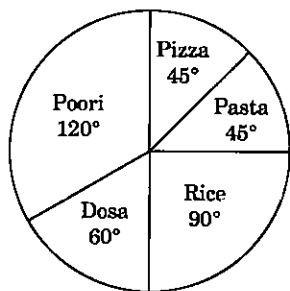
- (a) 42.5 (b) 40  
 (c) 45 (d) 5



- (iii) The upper limit of the class 60–70 is  
 (a) 60 (b) 70  
 (c) 65 (d) none of these
- (iv) The probability of a sure event is  
 (a) 0 (b) 2  
 (c) 1 (d) 3
- (v) The probability of an impossible event is  
 (a) 0 (b) 1 (c) 2 (d) 3

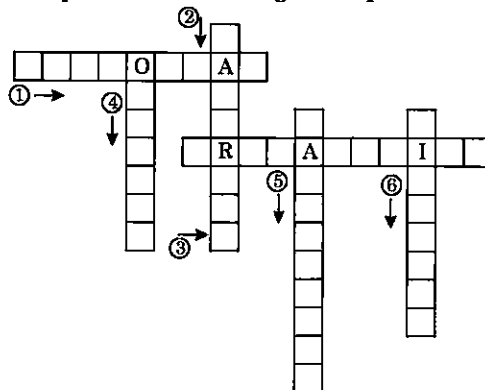
**Q3.** The given pie chart represents the food liking of 270 students of a school. Read the chart and answer the following questions.

- (i) How many students like poories?  
 (ii) How many students like dosa?  
 (iii) What percentage of students like pizza?  
 (iv) How many more students like Poori than Dosa?



1. (i)  $\frac{1}{2}$  (ii) 1 (iii) 0  
 (iv) total number of outcomes  
 (v) 1 (vi)  $\frac{1}{2}$
2. (i) (d) (ii) (c) (iii) (b)  
 (iv) (c) (v) (a)

**Q4.** Complete the following cross-puzzle:



**DIRECTIONS**

- There are three graphs to represent the given data. Bar graph, \_\_\_\_\_ and pie chart.
- \_\_\_\_\_ has equal width with equal gaps in between the bars.
- The maximum \_\_\_\_\_ of an event is 1.
- If a die is rolled once, the total \_\_\_\_\_ is 6.
- If a coin is tossed once, the \_\_\_\_\_ outcome of getting a head is 1.
- In a \_\_\_\_\_ the data are divided in central angles.

**ANSWERS**

3. (i) 90 (ii) 45 (iii)  $12\frac{1}{2}\%$   
 (v) 45
4. (1) HISTOGRAM (2) BARGRAPH  
 (3) PROBABILITY (4) OUTCOME  
 (5) FAVOURABLE (6) PIECHART